effects at this point, whether at the tip or in the cambium. But as soon as the cells cease to be meristematic, or embryonic, and begin to form vacuoles the haustoria are formed and modification of the cells begins.

The hyphæ keep up with the growth of the shoots by following the trachæ, from which they penetrate the surrounding tissues.

PHYSIOLOGICAL EFFECTS OF BORDEAUX MIXTURE

It has been claimed that Bordeaux mixture, in addition to its fungicidal effects, augments the assimilative activity or plants on which it is sprayed. Ewart (Zeitschr. Pflanzenkrank. XXII, p. 257: Bot. Gaz., June, 1913) finds by experimenting with potatoes, radishes and beans that the yield was always decreased by covering the leaves with the mixture, and in proportion to the strength of the mixture. He also found that the sugar content of currants was increased by spraying the *fruit* with the mixture, and decreased by spraying the leaves alone.

HERMAPHRODITISM IN AMPHIOXUS

Goodrich (Anat. Anz., 1913, p. 318) describes an interesting abnormality in this animal. A male specimen with 25 testes on one side had one of the 25 gonads on the other side a perfectly developed ovary with numbers of large ova. All the 49 testes were perfect and full of sperm.

RESISTANCE IN HIBERNATING ANIMALS

Bertarelli (Centr. Bakt., 1te Abt. Orig. XVIII, 1913, p. 566) finds that marmots are not more resistent to rabies, anthrax, tetanus, and diphtheria during hibernation than at other times. Blanchard had previously reported these animals to have increased resistance, during hibernation, to cobra venom, diphtheria, tetanus, trypanosomes and trichina.

MICROSCOPIC MEASUREMENT BY CAMERA LUCIDA

Joly (Sci. Proc. Roy. Dub. Soc., XIII, 1913, p. 441) suggests a simple method for measuring microscopic objects by means of the camera-lucida. Draw two fine lines, diverging from a point, on a

piece of white paper. The angle of divergence will be determined by the size of the object to be masured. The image of the object to be measured is projected on the sheet of paper. The paper is moved until the object just fills the space between the lines, and a mark is made across the lines at this point.

A stage micrometer scale is then substituted for the object and is moved along the diverging lines until a number of the divisions exactly cover the space between the lines. This point is marked as before by a cross line. The distance from the intersection of the lines to each of the cross lines is measured, and one has two similar triangles from which a single proportion can be derived in which the size of the object is the one unknown quantity—diameter of object: micrometer divisions:: distance from intersection to object: distance from intersection to micrometer.

MICRO-RADIOGRAPHY

Goby (Comp. Rend. CLVI, pp. 686-8: Trans. in J. R. M. S., Aug., 1913) reports the application of the X-ray to making visible the internal structure of opaque microscopic objects. "It replaces the method of section cutting, which is often slow and costly, and always indirect and destructive of the object, by a method which, whilst rapid and preserving the object itself, reveals sufficient detail to make it only necessary to enlarge the minute radiogram directly obtained, in order to be able to study it with the naked eye with the same facility as an ordinary macro-radiogram."

The difficulty of doing this has arisen in getting the necessary clearness of detail by means of Röntgen rays. This is overcome by an ingenious contrivance which suppresses the secondary or superfluous rays, and insures that the incident rays shall be normal. For details of the apparatus the reader must refer to the citations above. Figures are given which are enlarged (x 19-25) reproductions of micro-radiograms of Foraminifera and of the limbs of a small three-toed lizard. The results are remarkable.

CIRCULATION BY CONVECTION CURRENTS IN LABORATORY AQUARIA

Gemmill (J. R. M. S., June, 1913) describes a simple method for getting a gentle circulation and æration in single or serial small